

## EXPRESS TERMS

### ITEM 5-1

Amend the following sections of Chapter 16 of the 2001 CBC:

(UBC standards adopted by the Commission are applicable to all occupancies in California.)

#### CHAPTER 16 STRUCTURAL DESIGN REQUIREMENTS MATRIX ADOPTION TABLE

Adopting Agency	BSC	COMMENTS
Adopt entire UBC Chapter without amendments	<del>X</del>	
Adopt Entire UBC Chapter as amended <sup>1, 2</sup> (amended sections listed below)	<u>X</u>	
Adopt Only those sections of the UBC which are listed below and/or Adopt Only those California promulgated sections <sup>1, 2</sup> listed below		
<u>1612.3.2.1</u>	<u>CA</u>	
<u>1629.4.2.1</u>	<u>CA</u>	
<u>1630.2.3.4</u>	<u>CA</u>	
<u>1630.4.2.1</u>	<u>CA</u>	
<u>1630.8.2.1.1</u>	<u>CA</u>	
<u>1630.8.2.2.1</u>	<u>CA</u>	

Notation

Authority: Health & Safety Code Section 18934.5

Reference(s): Health & Safety Code, Division 13, Part 2.5, commencing with section 18901.

<sup>1</sup> New Amendments are shown underlined with "CA"

<sup>2</sup> Existing amendments of the 2001 California Building Code being repealed are shown stricken with "CA"

**CHAPTER 16  
STRUCTURAL DESIGN REQUIREMENTS**

**SECTION 1612 – COMBINATIONS OF LOADS**

**1612.3.2 [For applications not regulated by BSC] Alternate load combinations. ...**

**Notation**

Authority: Health & Safety Code Section 18934.5

Reference(s): Health & Safety Code, Division 13, Part 2.5, commencing with section 18901.

**1629.4.2 [For applications not regulated by BSC] Seismic Zone 4 near-source factor.** In Seismic Zone 4, each site shall...

**Notation**

Authority: Health & Safety Code Section 18934.5

Reference(s): Health & Safety Code, Division 13, Part 2.5, commencing with section 18901.

**1630.4.2 [For applications not regulated by BSC] Vertical combinations. ...**

**Notation**

Authority: Health & Safety Code Section 18934.5

Reference(s): Health & Safety Code, Division 13, Part 2.5, commencing with section 18901.

**1630.8.2.1 [For applications not regulated by BSC] General.** Where any portion of the lateral-load-resisting system...

**Notation**

Authority: Health & Safety Code Section 18934.5

Reference(s): Health & Safety Code, Division 13, Part 2.5, commencing with section 18901.

**1630.8.2.2 [For applications not regulated by BSC] Detailing requirements in Seismic Zones 3 and 4.** In Seismic Zone 4, each site shall...

**Notation**

Authority: Health & Safety Code Section 18934.5

Reference(s): Health & Safety Code, Division 13, Part 2.5, commencing with section 18901.

**ITEM 5-1 – Committee Recommendations**

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(END OF ITEM)

**ITEM 5-2**

Delete entire Table **16.1-N - STRUCTURAL SYSTEMS** and amend existing Table **16-N** as follows:

**TABLE 16-N – STRUCTURAL SYSTEMS<sup>1</sup>**  
(For Occupancies regulated by BSC use Table 16.1-N)

BASIC STRUCTURAL SYSTEM <sup>2</sup>	LATERAL-FORCE-RESISTING SYSTEM DESCRIPTION	R	$\Omega_o$	HEIGHT LIMIT FOR SEISMIC ZONES 3 AND 4 (feet)
				x 304.8 for mm
1. Bearing wall system	1. Light-framed walls with shear panels			
	a. Wood structural panel walls for structures three stories or less	5.5	2.8	65
	b. All other light-framed walls	4.5	2.8	65
	2. Shear walls			
	a. Concrete	4.5	2.8	160
	b. Masonry	4.5	2.8	160
	3. Light steel-framed bearing walls with tension-only bracing	2.8	2.2	65
	4. Braced frames where bracing carries gravity load			
	a. Steel	4.4	2.2	160
2. Building frame system	b. Concrete <sup>3</sup>	2.8	2.2	-
	c. Heavy timber	2.8	2.2	65
	1. Steel eccentrically braced frame (EBF)	7.0	2.8	240
	2. Light-framed walls with shear panels.			
	a. Wood structural panel walls for structures three stories or less	6.5	2.8	65
	b. All other light-framed walls	5.0	2.8	65
	3. Shear walls			
	a. Concrete	5.5	2.8	240
	b. Masonry	5.5	2.8	160
	4. Ordinary braced frames			
	a. Steel <sup>6</sup> <b>[Not adopted by BSC]</b>	5.6	2	160
	aa. Steel <sup>9</sup> <b>[For BSC]</b>	5	2	35 <sup>6</sup>
	b. Concrete <sup>3</sup>	5.6	2.2	-
	c. Heavy timber		2.2	
	5. Special concentrically braced frames	6.4		240
	a. Steel		2.2	
3. Moment-resisting frame system	1. Special moment-resisting frame (SMRF)			
	a. Steel	8.5	2.8	N.L.
	b. Concrete <sup>4</sup>	8.5	2.8	N.L.
	2. Masonry moment-resisting wall frame (MMRWF)	6.5	2.8	160
	3. Concrete intermediate moment-resisting frame (IMRF) <sup>5</sup> <b>[Not adopted by BSC]</b>			
	3.1 Intermediate moment-resisting frame (IMRF) <b>[For BSC]</b>			-
	a. Steel <sup>6</sup>			
	b. Concrete <sup>5</sup>	4.5	2.8	35 <sup>9</sup>
	4. Ordinary moment-resisting frame (OMRF)	5.5	2.8	-
	a. Steel <sup>6</sup> <b>[Not adopted by BSC]</b>			
	aa. Steel <sup>6</sup> <b>[For BSC]</b>	4.5	2.8	-
	b. Concrete <sup>8</sup>	3.5	2.8	35 <sup>6</sup>
	5. Special truss moment frames of steel (STMF)	3.5	2.8	-
		6.5	2.8	240

4. Dual systems	1. Shear walls			
	a. Concrete with SMRF	8.5	2.8	N.L.
	b. Concrete with steel OMRF <b>[For BSC Not Permitted]</b>	4.2	2.8	160
	c. Concrete with concrete IMRF <sup>5</sup>	6.5	2.8	160
	d. Masonry with SMRF	5.5	2.8	160
	e. Masonry with steel OMRF <b>[For BSC Not Permitted]</b>	4.2	2.8	160
	f. Masonry with concrete IMRF <sup>3</sup>	4.2	2.8	-
	g. Masonry with masonry MMRWF	6.0	2.8	160
	2. Steel EBF	8.5	2.8	N.L.
	a. With steel SMRF	4.2	2.8	160
	b. With steel OMRF <b>[For BSC Not Permitted]</b>	6.5	2.8	N.L.
	3. Ordinary braced frames <b>[For BSC Not Permitted]</b>	4.2	2.8	160
	a. Steel with steel SMRF	6.5	2.8	-
	b. Steel with steel OMRF	4.2	2.8	-
	c. Concrete with concrete SMRF <sup>3</sup>			
	d. Concrete with concrete IMRF <sup>3</sup>	7.5	2.8	N.L.
5. Cantilevered column building systems	4. Special concentrically braced frames	4.2	2.8	160
	a. Steel with steel SMRF			
6. Shear wall-frame interaction systems	b. Steel with steel OMRF <b>[For BSC Not Permitted]</b>			
	5. Steel IMRF <b>[For BSC Not Permitted]</b>			
7. Undefined systems	1. Cantilevered column elements	2.2	2.0	35'
	1. Concrete <sup>8</sup>	5.5	2.8	160
	See Section 1629.6.7 and 1629.9.2	-	-	-

N.L.— no limit

<sup>1</sup> See Section 1630.4 for combination of structural systems.

<sup>2</sup> Basic structural systems are defined in Section 1629.6.

<sup>3</sup> Prohibited in Seismic Zones 3 and 4.

<sup>4</sup> Includes precast concrete conforming to Section 1921.2.7.

<sup>5</sup> Prohibited in Seismic Zones 3 and 4, except as permitted in Section 1634.2.

<sup>6</sup> Ordinary moment-resisting frames in Seismic Zone 1 meeting the requirements of Section 2214.6 may use a *R* value of 8.

<sup>7</sup> Total height of the building including cantilevered columns.

<sup>8</sup> Prohibited in Seismic Zones 2A, 2B, 3 and 4. See Section 1633.2.7.

<sup>9</sup> Unless otherwise approved by the enforcement agency, in Seismic Zone 4 :

<sup>9.1</sup> Steel IMRF are permitted for buildings 35 ft. or less in height and the dead load of the roof, walls or floors not exceeding 35 psf each; or for single-story buildings 60 ft. or less in height with dead load of the roof or walls not exceeding 15 psf each where the moment joints of field connections are constructed of bolted end plates; or single-family dwellings using light frame construction with  $R = 3.0$  and  $\Omega_o = 2.2$ .

<sup>9.2</sup> Steel OMRF are permitted for buildings 35 ft or less in height with the dead load of the roof, walls or floors not exceeding 15 psf each; or single-story buildings 60 ft or less in height with the dead load of the roof or walls not exceeding 15 psf each and where the moment joints of field connections are constructed of bolted end plates.

<sup>9.3</sup> Steel Ordinary Braced Frames are permitted for buildings 35 ft or less in height; or penthouse structures; or single-story buildings 60 ft or less in height with the dead load of the roof or walls not exceeding 15 psf. each.

#### Notation

Authority: Health & Safety Code Section 18934.5

Reference(s): Health & Safety Code, Division 13, Part 2.5, commencing with section 18901.

#### ITEM 5-2 – Committee Recommendations

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(END OF ITEM)

#### ITEM 5-3

#### Amend the following sections of Chapter 19 of the 2001 CBC:

(UBC standards adopted by the Commission are applicable to all occupancies in California.)

#### CHAPTER 19 CONCRETE MATRIX ADOPTION TABLE

Adopting Agency	BSC	COMMENTS
Adopt entire UBC Chapter without amendments	<del>X</del>	
Adopt Entire UBC Chapter as amended <sup>3, 4</sup> (amended sections listed below)	<u>X</u>	
Adopt Only those sections of the UBC which are listed below and/or Adopt Only those California promulgated sections <sup>1, 2</sup> listed below		
<u>1915.2.2.1</u>	<u>CA</u>	
<u>1928.1.2.3.1</u>	<u>CA</u>	

#### Notation

Authority: Health & Safety Code Section 18934.5

Reference(s): Health & Safety Code, Division 13, Part 2.5, commencing with section 18901.

#### CHAPTER 19 CONCRETE Division II

#### SECTION 1915 – FOOTINGS

**1915.2.2** [For applications not regulated by BSC] Base area of footing or number...

#### Notation

Authority: Health & Safety Code Section 18934.5

Reference(s): Health & Safety Code, Division 13, Part 2.5, commencing with section 18901.

**1928.1.2.3** [For applications not regulated by BSC] **Basic combinations.** When permitted by Section 1928.1, structures, components and...

#### Notation

Authority: Health & Safety Code Section 18934.5

Reference(s): Health & Safety Code, Division 13, Part 2.5, commencing with section 18901.

<sup>1</sup> New Amendments are shown underlined with "CA"

<sup>2</sup> Existing amendments of the 2001 California Building Code being repealed are shown stricken with "CA"

### ITEM 5-3 – Committee Recommendations

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(END OF ITEM)

### ITEM 5-4

#### Amend the following sections of Chapter 22 of the 2001 CBC:

(UBC standards adopted by the Commission are applicable to all occupancies in California.)

#### CHAPTER 22 STEEL MATRIX ADOPTION TABLE

Adopting Agency	BSC	COMMENTS
Adopt entire UBC Chapter without amendments	<del>X</del>	
Adopt Entire UBC Chapter as amended <sup>5, 6, 7</sup> (amended sections listed below)	<u>X</u>	
Adopt Only those sections of the UBC which are listed below and/or Adopt Only those California promulgated sections <sup>1, 2, 3</sup> listed below		
<u>2204.1.1</u>	<u>CA</u>	
<u>2204.2.1</u>	<u>CA</u>	

#### Notation

Authority: Health & Safety Code Section 18934.5

Reference(s): Health & Safety Code, Division 13, Part 2.5, commencing with section 18901.

#### CHAPTER 22 STEEL Division II

#### SECTION 2204 – DESIGN METHODS

Design shall be by one of the ...

**2204.1 [For applications not regulated by BSC] Load and Resistance Factor Design.** Steel design based on load and resistance ...

<sup>1</sup> New Amendments are shown underlined with "CA"

<sup>2</sup> Existing amendments of the 2001 California Building Code being repealed are shown stricken with "CA"

**Notation**

Authority: Health & Safety Code Section 18934.5

Reference(s): Health & Safety Code, Division 13, Part 2.5, commencing with section 18901.

**2204.2 [For applications not regulated by BSC] Allowable Stress Design.** Steel design based on allowable stress design ...

**Notation**

Authority: Health & Safety Code Section 18934.5

Reference(s): Health & Safety Code, Division 13, Part 2.5, commencing with section 18901.

**ITEM 5-4 – Committee Recommendations**

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(END OF ITEM)

**ITEM 5-5****Amend the following sections of Chapter 23 of the 2001 CBC:**

(UBC standards adopted by the Commission are applicable to all occupancies in California.)

**CHAPTER 23**  
**WOOD**  
**MATRIX ADOPTION TABLE**

Adopting Agency	BSC	COMMENTS
Adopt entire UBC Chapter without amendments	<del>X</del>	
Adopt Entire UBC Chapter as amended <sup>8, 9</sup> (amended sections listed below)	<u>X</u>	
Adopt Only those sections of the UBC which are listed below and/or Adopt Only those California promulgated sections <sup>1, 2</sup> listed below		
<u>2315.5.6</u>	<u>CA</u>	
<u>TABLE 23-II-L</u>	<u>CA</u>	
<u>2316.3</u>	<u>CA</u>	

**Notation**

Authority: Health & Safety Code Section 18934.5

Reference(s): Health & Safety Code, Division 13, Part 2.5, commencing with section 18901.

<sup>1</sup> New Amendments are shown underlined with "CA"

<sup>2</sup> Existing amendments of the 2001 California Building Code being repealed are shown stricken with "CA"

## CHAPTER 23 – WOOD

### Division III –DESIGN SPECIFICATIONS FOR ALLOWABLE STRESS DESIGN OF WOOD BUILDINGS

#### Part I – ALLOWABLE STRESS DESIGN OF WOOD

This standard, with certain exceptions, is the ANSI/NFPA NDS-91 *[For BSC, NDS-97 2001]* National Design Specification for Wood Construction of the American Forest and Paper Association, 1991 Edition, and the Supplement to the 1991 Edition, *[For BSC, NDS-97 2001]* National Design Specification, adopted by reference.

The National Design Specification for Wood Construction, 1991 Edition, *[For BSC, NDS-97 2001]* and supplement are available from the American Forest and Paper Association, 1111 19th Street, NW, Eighth Floor, Washington, DC, 20036.

#### Notation

Authority: Health & Safety Code Section 18934.5

Reference(s): Health & Safety Code, Division 13, Part 2.5, commencing with section 18901.

#### SECTION 2316 - DESIGN SPECIFICATIONS

**2316.1 Adoption and Scope.** The National Design Specification for Wood Construction, 1991 Edition (NDS), *[For BSC, 1997 2001 Edition (NDS) as amended by Sec. 2316.2 2316.3]* which is hereby adopted ~~*[For BSC except for item 14, 26 & 27]*~~ as a part of this code, shall apply to the design and construction of wood structures using visually graded lumber, mechanically graded lumber, structural glued laminated timber, and timber piles. National Design Specifications Appendix Section F, Design for Creep and Critical Deflection Applications, Appendix Section G, Effective Column Length, and Appendix Section J, Solution of Hankinson Formula are specifically adopted and made a part of this standard. The Supplement to the 1991 Edition National Design Specification, *[For BSC, NDS-97 2001]* Tables 2A, 4A, 4B, 4C, 4D, 4E, 5A, 5B and 5C are specifically adopted and made a part of this standard.

Other codes, standards or specifications referred to in this standard are to be considered as only an indication of an acceptable method or material that can be used with the approval of the building official, except where such other codes, standards or specifications are specifically adopted by this code as primary standards.

**2316.2 Amendments.** *[For applications not regulated by BSC]...*

#### **2316.3 [For BSC] Amendments.**

**1. Sec. 2.3.2.1. In fourth sentence, delete 'or Figure B1 (see Appendix B).':**

**2. Sec. 2.3.2.3. Delete and substitute the following:**

**2.3.2.3** *When using Section 1612.3.1 basic load combinations, the Load Duration Factor,  $C_D$ , noted in Table 2.3.2 shall be permitted to be used. When using Section 1612.3.2 alternate load combinations, the one-third increase shall not be used concurrently with the Load Duration Factor  $C_D$ .*

**3. Table 2.3.2. Delete and substitute as follows:**

**TABLE 2.3.2 – LOAD DURATION FACTORS,  $C_D$**

<b>DESIGN LOAD</b>	<b>LOAD DURATION</b>	<b><math>C_D</math></b>
<i>Dead Load</i>	<i>Permanent</i>	<i>0.9</i>
<i>Floor, Occupancy Live Load</i>	<i>Ten Years</i>	<i>1.0</i>
<i>Snow Load</i>	<i>Two Months</i>	<i>1.15</i>
<i>Roof Live Load</i>	<i>Seven Days</i>	<i>1.25</i>
<i>Earthquake Load<sup>1</sup></i>	<i>-</i>	<i>1.33</i>
<i>Wind Load<sup>2</sup></i>	<i>-</i>	<i>1.33</i>
<i>Impact</i>	<i>-</i>	<i>2.0</i>

<sup>1</sup> 1.60 may be used for nailed and bolted connections exhibiting Mode III or IV behavior, except that the increases for earthquake are not combined with the increase allowed in Section 1612.3. The 60-percent increase for nailed and bolted connections exhibiting Mode III or IV behavior for earthquake shall not be applicable to joist hangers, framing anchors, and other mechanical fastenings, including straps and hold-down anchors. The 60-percent increase shall not apply to the allowable shear values in Tables 23-II-H, 23-II-I-1, 23-II-I-2, 23-II-J or in Section 2315.3.



<sup>2</sup> 1.60 may be used for members and nailed and bolted connections exhibiting Mode III or IV behavior, except that the increases for wind are not combined with the increase allowed in Section 1612.3. The 60-percent increase shall not apply to the allowable shear values in Tables 23-II-H, 23-II-I-1, 23-II-I-2, 23-II-J or in Section 2315.3.

**4. Sec. 2.3.4. Add a second paragraph following Table 2.3.4:**

The allowable unit stresses for fire-retardant-treated solid-sawn lumber and plywood, including fastener values, subject to prolonged elevated temperatures from manufacturing or equipment processes, but not exceeding 150° F (66° C), shall be developed from approved test methods that properly consider potential strength-reduction characteristics, including effects of heat and moisture.

**5. Sec. 2.3.6. Add second, third and fourth paragraphs as follows:**

The values for lumber and plywood impregnated with approved fire-retardant chemicals, including fastener values, shall be submitted to the enforcement agency for approval. Submittal to the enforcement agency shall include all substantiating data. Such values shall be developed from approved test methods and procedures that consider potential strength-reduction characteristics, including the effects of elevated temperatures and moisture. Other adjustments are applicable, except that the impact load-duration factor shall not apply.

Values for glued-laminated timber, including fastener design values, shall be recommended by the treater and submitted to the enforcement agency for approval. Submittal to the enforcement agency shall include all substantiating data.

In addition to the requirements specified in Section 207, fire retardant lumber having structural applications shall be tested and identified by an approved inspection agency in accordance with UBC Standard 23-5.

**6. Sec. 4.4.1. Add a section as follows:**

**4.4.1.4 Bridging for Floor Joists and Roof Joists or Rafters.**

Roof joists or rafters of more than 8-inch (203 mm) depth and floor joists of more than 4-inch (102 mm) depth which are spaced 32 inches (813 mm) on center or less shall be provided with bridging to distribute superimposed loads. Floor joists shall be bridged every 8 feet (2438 mm) and roof joists or rafters every 10 feet (3048 mm) by solid blocking 2 inches (51 mm) thick and the full depth of the joist or rafter, or by wood cross bridging of not less than 1 inch by 3 inches (25 mm by 76 mm) or nailed metal cross bridging of equal strength. Where cross bridging is used, the lower ends of such cross bridging shall be driven up and nailed after the floor, subfloor or roof has been nailed.

**7. Sec. 5.4. Add a new section as follows:**

**5.4.5 Ponding.** Roof-framing members shall be designed for the deflection and drainage or ponding requirements specified in Section 1506 and Chapter 16A. In glued-laminated timbers, the minimum slope for roof drainage required by Section 1506 shall be in addition to a camber of one and one-half times the calculated dead load deflection. The calculation of the required slope shall not include any vertical displacement created by short taper cuts. In no case shall the deflection of glued-laminated timber roof members exceed 1/2-inch (13 mm) for a 5 pound-per-square-foot (239 Pa) uniform load.

**8. Sec. 5.4. Add a new section as follows:**

**5.4.6 Tapered Faces.** Sawn tapered cuts shall not be permitted on the tension face of any beam. Pitched or curved beams shall be so fabricated that the laminations are parallel to the tension face. Straight, pitched or curved beams may have sawn tapered cuts on the compression face.

For other members subject to bending, the slope of tapered faces, measured from the tangent to the lamination of the section under consideration, shall not be steeper than 1 unit vertical in 24 units horizontal (4% slope) on the tension side.

**EXCEPTIONS:**

1. This requirement does not apply to arches.
2. Taper may be steeper at sections increased in size beyond design requirements for architectural projections.

**9. Sec. 11.1.5.6. Delete and substitute as follows:**

**11.1.5.6** For wood-to-wood joints, the spacing center to center of nails in the direction of stress shall not be less than the required penetration. Edge or end distances in the direction of stress shall not be less than one-half of the required penetration. All spacing and edge and end distances shall be such as to avoid splitting of the wood.

**Notation**

Authority: Health & Safety Code Section 18934.5

Reference(s): Health & Safety Code, Division 13, Part 2.5, commencing with section 18901.

**ITEM 5-5 – Committee Recommendations**

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(END OF ITEM)

**INITIAL STATEMENT OF REASONS****STATEMENT OF SPECIFIC PURPOSE AND RATIONALE:**

The California Building Standards Commission (CBSC) proposes the adoption of new amendments to current edition of the Uniform Building Code (UBC) of the International Conference of Building Officials (ICBO). The adoption of these amendments will make them applicable for use by individuals, businesses and state agencies as required by the Health & Safety Code, Section 18928.

**2001 California Building Code, California Code of Regulations, Title 24, Part 2, Vol. 2:**

The purpose for this proposed action is to amend the current edition of the UBC to reference a more current edition of the National Design Standards (NDS) and to clarify other amended sections. The necessity of this proposed action is to update the referenced structural standards for wood frame construction. The currently adopted model building code references the 1997 (NDS), as was amended by rule in an emergency proposal submitted last year by the Building Standards Commission. This action is proposed to further update the version of the NDS to the 2001 edition with amendments to be consistent with the structural requirements of the other adopting state agencies.

**TECHNICAL, THEORETICAL, AND EMPIRICAL STUDY, REPORT, OR SIMILAR DOCUMENTS:**

There were no formal studies or reports used as the bases for the proposed adoption of the proposed amendments to the California Building Code. This proposed action is mandated by the Health & Safety Code, Section 18928.

**CONSIDERATION OF REASONABLE ALTERNATIVES**

There are no reasonable alternatives identified by the agency.

**REASONABLE ALTERNATIVES THE AGENCY HAS IDENTIFIED THAT WOULD LESSEN ANY ADVERSE IMPACT ON SMALL BUSINESS.**

No alternatives were identified by the agency to lessen the adverse impact on small businesses.

**FACTS, EVIDENCE, DOCUMENTS, TESTIMONY, OR OTHER EVIDENCE OF NO SIGNIFICANT ADVERSE IMPACT ON BUSINESS.**

No facts, evidence, documents, testimony, or other evidence of no significant adverse economic impact on business have been identified however, the adoption of amendments to the current edition of model code is mandated by the Health & Safety Code, Section 18928.

#### **DUPLICATION OR CONFLICTS WITH FEDERAL REGULATIONS**

There are no federal regulations related to the proposed amendments to the current edition of California building code.